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ABSTRACT

A transmittance overcoat with effectively planar top surface and specified optical and materials properties is applied above a microlens layer to extend the focal length and enhance the performance of long focal length microlenses for semiconductor array color imaging devices. The geometrical optics design factors and microelectronic fabrication sequence to achieve optimized long focal length microlens performance are disclosed. The principal advantages of the adaptive process taught in the present invention is shown to enable real-time compensation adjustments for process and material variations. The overcoat process enables simplified single-layer integrated microlens optics for low-cost, high volume manufacturing of CMOS and CCD color video cameras.